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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/586,825	08/14/2008	Sung-Ik Park	51876P1119	8986

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EXAMINER
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SHEN, QUN

ART UNIT	PAPER NUMBER
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2617

MAIL DATE	DELIVERY MODE
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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/586,825	<b>Applicant(s)</b> PARK ET AL.	
	<b>Examiner</b> QUN SHEN	<b>Art Unit</b> 2617	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 18 July 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 July 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>1/30/07, 12/18/08</u> . | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

This communication is a First Action non Final on the merits. Claims 1-16, as originally filed, are currently pending and have been considered below.

#### ***Priority***

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

#### ***Drawings***

2. Figures 1-3 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g) (see specification: lines 12-19, page 6). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

#### ***Claim Objection***

3. Claims 1 and 9 are objected to because of the following informalities:  
Claims 1 and 9 recite "... receives the signal on one channel..." in line 2 of claims 1 and 9 of pages 13 and 14, respectively. "the signal" is lack of antecedent basis.

Appropriate correction is required.

### ***Double Patenting***

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

**4. Claims 1-5 and 9-13 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of US 7,301,994 B2, Park et al. (hereinafter Park), in view of in view of US 5,828,954 Wang (hereinafter Wang).**

Park discloses limitations of 1-5 except a radio frequency (RF) up-converting means for up-converting the filtered signal into an RF signal. Wang teaches a radio frequency

(RF) up-converting means for up-converting the filtered signal into an RF signal (Wang: Fig 2: 190, col 6, lines 27-30). Therefore, consider Park and Wang's teachings together, it would have been obvious to one of the skill in the art at the time of invention to incorporate Wang's RF up-converting means to Park's apparatus as a complete RF modulator.

Some comparisons of the claims of two copending applications are shown as below:

10/589542 (claim 1-5, 9-13)	7,301,994
<p>1. A modulating apparatus of an on-channel repeater which receives the signal on one channel and distributes the signal on the same channel, comprising: a baseband signal configuring means for configuring a baseband signal by combining an input field and a segment sync signal; a pilot adding means for adding a pilot signal to the baseband signal; a filtering means for filtering the baseband signal with the pilot signal added thereto; and a radio frequency (RF) up-converting means for up-converting the filtered signal into an RF signal.</p> <p>3. The modulating apparatus as recited in claim 2, wherein the filtering means generates an in-phase (I) signal and a quadrature (Q) signal which have a different phase with respect to the up-sampled signal and performs filtration.</p> <p>4. The modulating apparatus as recited in claim 3, further comprising: an adding means for adding up the up-converted RF I and Q signals.</p> <p>5. The modulating apparatus as recited in</p>	<p>Claim 1 A modulation apparatus comprising:</p> <p>a baseband signal forming means for forming a baseband signal by combining the output signals of an equalization unit with pre-defined field/segment synchronization signals in a plurality of on-channel repeaters;</p> <p>a pilot inserting means for inserting a pilot signal to the baseband signal;</p> <p>an up-sampling means for up-sampling the baseband signal with the pilot signal;</p> <p>a <u>vestigial sideband</u> (VSB) filtering means for filtering the up-sampled baseband signal based on a Window technique and an Equi-Ripple filter to form an in-phase (I) signal and a quadrature (Q) signal;</p> <p>an up-converting means for up-converting the frequencies of the filtered I and Q signals to frequencies of an intermediate frequency (IF) band;</p> <p>an adding means for adding the up-converted I and Q signals and converting a resultant signal into a digital VSB signal of the IF band; and</p> <p>a digital-to-analogue converting means for converting the digital signal of the IF band to an analogue signal, <u>wherein the</u></p>

<p>any one of claims 1 to 4, further comprising: a digital-to-analog converting means for converting the filtered baseband signal into an analog signal.</p> <p>9. A modulating method of an on-channel repeater which receives the signal on one channel and distributes the signal on the same channel, comprising: baseband signal configuring step of configuring a baseband signal by combining an input field and a segment sync signal; a pilot adding step of adding a pilot signal to the baseband signal; a filtering step of filtering the baseband signal with the pilot signal added thereto; and a radio frequency (RF) up-converting step of up-converting the filtered signal into an RF signal.</p>	<p><u>modulation apparatus operates to reduce time delay of each of the plurality of on-channel repeaters in a terrestrial digital television broadcasting system.</u></p>

**5. Claims 6-7 and 14-15 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over Park, in view of Wang and further in view of US 6,658,261 B1, Winters et al. (hereinafter Winters).**

As to claim 6, Park discloses the modulating apparatus as recited in claim 1 or 2 but does not disclose the filtering means includes an Equi-Ripple (ER) filter. Winters, however, teaches using Parks-McClellan optimal equiripple filter as a low pass filter with appropriate windowing type and length for improving wireless communication performance under fading environment (Winters: col. 4, lines 25 – 37). Therefore, consider Park and Winters teachings together, it would have been obvious to one of skill

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in the art at the time of invention to further modify Park's modulation apparatus by incorporating Winters's teachings on equiripple filter and appropriate windowing response to improve the performance of wireless communication system with reduced group delay under fading environment.

As to claim 7, Park as modified discloses the modulating apparatus as recited in claim 1 or 2, wherein the filtering means includes an ER filter (see analysis of claim 6).

As to claims 14 – 15, the claims are rejected with the same reason set forth for claims 6-8, respectively (see analysis and rejections of claims 6-7 above).

**6. Claims 8 and 16 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over Park in view of Wang, and further in view of Winters, and AAPA (Applicant Admitted Prior Art).**

As to claim 8, Park as modified discloses the modulating apparatus as recited in claim 1 or 2, and a VSB filter with window method but does not disclose wherein the filtering means includes a square root raised cosine (SRRC) filter. AAPA teaches using a SRRC filter (AAPA: line 11, lines 29-34, pg 3). Consider Park as modified and AAPA's teachings together, it would have been obvious to one of skill in the art to further modify Park as modified's method by incorporating AAPA's teachings on SRRC filter to construct a modulation apparatus with less group delay.

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As to claim 16, the claim is rejected with the same reason set forth for claims 8.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in **Graham v. John Deere Co., 383 U.S. 1, 148 USPQ 459 (1966)**, that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows: (*See MPEP Ch. 2141*)

Determining the scope and contents of the prior art;  
Ascertaining the differences between the prior art and the claims in issue;  
Resolving the level of ordinary skill in the pertinent art; and  
Evaluating evidence of secondary considerations for indicating obviousness or nonobviousness.

**7. Claims 1-5 and 9-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA (Applicant Admitted Prior Art (hereinafter AAPA), in view of Wang.**

As to claim 1, AAPA discloses a modulating apparatus of an on-channel repeater which receives the signal on one channel and distributes the signal on the same channel (AAPA: Figs 1-2; page 1, lines 24- 33 page 2, lines 7-17), comprising: a baseband signal configuring means for configuring a baseband signal by combining an input field and a segment sync signal (AAPA: Fig 3: 310; page 3, lines 1-17); a pilot adding means



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for adding a pilot signal to the baseband signal (AAPA: Fig 3: 320; page 3, lines 1-17); a filtering means for filtering the baseband signal with the pilot signal added thereto (AAPA: Fig 3: 340; page 3, lines 1-28).

AAPA does not expressly disclose a radio frequency (RF) up-converting means for up-converting the filtered signal into an RF signal. Wang, however, teaches a radio frequency (RF) up-converting means for up-converting the filtered signal into an RF signal (Wang: Fig 2: 190, col 6, lines 27-30). Therefore, consider AAPA and Wang's teachings together, it would have been obvious to one of the skill in the art at the time of invention to incorporate Wang's RF up-converting means to AAPA's apparatus as a complete RF modulator.

As to claim 2, AAPA as modified discloses the modulating apparatus as recited in claim 1, further comprising an up-sampling means for up-sampling the baseband signal with the pilot signal added thereto (AAPA: Fig 3: 330, also Wang: Fig 2:170).

As to claim 3, AAPA as modified discloses the modulating apparatus as recited in claim 2, wherein the filtering means generates an in-phase (I) signal and a quadrature (Q) signal which have a different phase with respect to the up-sampled signal and performs filtration (AAPA: Fig 3: 350, also Wang: Fig 2: 175).

As to claim 4, AAPA as modified discloses the modulating apparatus as recited in claim 3, further comprising: an adding means for adding up the up-converted RF I and Q

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signals (AAPA: Fig 3: 360, lines 14-15, pg 3).

As to claim 5, AAPA as modified discloses the modulating apparatus as recited in any one of claims 1 to 4, further comprising: a digital-to-analog converting means for converting the filtered baseband signal into an analog signal (AAPA: Fig 3: 370, also Wang: Fig 2:185).

As to claim 9, claim 9 is a method claim that is encompassed and necessitated by apparatus claim 1. Rejection of claim 1 is therefore incorporated herein (see analysis and rejection above).

As to claims 10 – 13, the claims are rejected with the same reason set forth for claims 2-8, respectively (see analysis and rejections of claims 2-5 above).

**8. Claims 6-8 and 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA, in view of Wang, and further in view of Winters.**

As to claim 6, AAPA as modified discloses the modulating apparatus as recited in claim 1 or 2 but does not disclose the filtering means includes an Equi-Ripple (ER) filter and uses a window method. Winters, however, teaches using Parks-McClellan optimal equiripple filter as a low pass filter with appropriate windowing type and length for improving wireless communication performance under fading environment (Winters: col 4, lines 25 – 37). Therefore, consider AAPA as modified and Winters teachings

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together, it would have been obvious to one of skill in the art at the time of invention to further modify AAPA as modified's modulation apparatus by incorporating Winters's teachings on equiripple filter and appropriate windowing response to improve the performance of wireless communication system with reduced group delay under fading environment.

As to claim 7, AAPA as modified discloses the modulating apparatus as recited in claim 1 or 2, wherein the filtering means includes an ER filter (see analysis of claim 6).

As to claim 8, AAPA as modified discloses the modulating apparatus as recited in claim 1 or 2, wherein the filtering means includes a square root raised cosine (SRRC) filter and uses a window method (AAPA: line 11, lines 29-34, pg 3. It would have been obvious to one of skill in the art to apply window method taught by Winters with SRRC filter, see claim 6 for motivation).

As to claims 14 – 16, the claims are rejected with the same reason set forth for claims 6-8, respectively (see analysis and rejections of claims 6-8 above).

***Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to QUN SHEN whose telephone number is (571)270-7927. The examiner can normally be reached on Monday through Thursday, 9:30am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, LunYi Lao can be reached on 571-272-7671. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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